

ADMINISTRATIVE RULES FOR GRAYWATER SYSTEMS

R317-401, UTAH ADMINISTRATIVE CODE



**UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY**

EFFECTIVE DATE - JULY 2, 2004

R317. Environmental Quality, Water Quality**R317-401. Graywater Systems****R317-401-1. General.**

(a). This rule shall apply to the construction, installation, modification and repair of graywater systems for subsurface landscape irrigation for single-family residences.

(b). Nothing contained in this rule shall be construed to prevent the permitting local health department from:

(i). adopting stricter requirements than those contained herein;

(ii). prohibiting graywater systems; and

(iii). assessment of fees for administration of graywater systems.

(c). Graywater shall not be:

(i). applied above the land surface;

(ii). applied to vegetable gardens except where graywater is not likely to have direct contact with the edible part, whether the fruit will be processed or not;

(iii). allowed to surface; or

(iv). discharged directly into or reach any storm sewer system or any waters of the State.

(d). It shall be unlawful for any person to construct, install or modify, or cause to be constructed, installed or modified any graywater system in a building or on a given lot without first obtaining a permit to do such work from the local health department.

(e). The local health department may require the graywater system in its jurisdiction, be placed under:

(i). an umbrella of a management district for the purposes of operation, maintenance and repairs,

(ii). a third-party operation, maintenance and repair contract at the expense of the permittee with a requirement of notification by the permittee and the contractor to the local health department, of the termination of such services.

R317-401-2. Definitions

(a). "Graywater" is untreated wastewater, which has not come into contact with toilet waste. Graywater includes

wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, laundry tubs, etc., and does not include wastewater from kitchen sinks, photo lab sinks, dishwashers, garage floor drains, or other hazardous chemicals.

(b). Surfacing of graywater means the ponding, running off, or other release of graywater to or from the land surface.

(c). "The local health department" means a city-county or multi-county local health department established under Title 26A, which has been given approval by the Utah Water Quality Board to issue permits for graywater systems within its jurisdiction.

(d). "Bedroom" means any portion of a dwelling which is so designed as to furnish the minimum isolation necessary for use as a sleeping area. It may include, but not limited to, a den, study, sewing room, sleeping loft, or enclosed porch. Unfinished basements shall be counted as a minimum of one additional bedroom.

R317-401-3. Administrative Requirements

(a). The local health department having jurisdiction must obtain approval from the Utah Water Quality Board to administer a graywater systems program, as outlined in this section, before permitting graywater systems.

(b). The local health department request for approval must include a description of its plan to properly manage these systems to protect public health. This plan must include:

(i). Documentation of:

(1). the adequacy of staff resources to manage the increased work load;

(2). the technical capability to administer the new systems including any training plans which are needed;

(3). the Local Board of Health and County Commission support this request; and

(4). the county's legal authority to implement and enforce correction of malfunctioning systems and its commitment to exercise this authority.

(ii). An agreement to:

(1). advise the owner of the system of

the type of system, and information concerning risk of failure, level of maintenance required, financial liability for repair, modification or replacement of a failed system and periodic monitoring requirements;

(2). advise the building permitting agency of the approved graywater system on the property;

(3). provide oversight of installed systems;

(4). record the existence of the system on the deed of ownership for that property;

(5). issue a renewable operating permit at a frequency not exceeding five years with inspection of the permitted systems before renewal; or, inspect annually the greater of 20 per cent of all installed system or the minimum of ten installed systems; and

(6). maintain records of all installed systems, failures, modifications, repairs and all inspections recording the condition of the system at the time of inspection such as, but not limited to, overflow, surfacing, ponding and nuisance.

R317-401-4. Permitting or Approval Requirements

(a). Designer certified at Level 3, in accordance with the requirements of R317-11, shall design the graywater systems.

(b). The local health department may require the following information with or in the plot plan before a permit is issued for a graywater system:

(i). plot plan drawn to scale, completely dimensioned, showing lot lines and structures, direction and slope of the ground, location of all present or proposed retaining walls, drainage channels, water supply lines, wells, paved areas and structures on the plot, other utilities, easements, number of bedrooms and plumbing fixtures plan in each structure, location of onsite wastewater system and replacement area of the onsite wastewater system, or building sewer connecting to a public sewer, and location of the proposed graywater system;

(ii). a log of soil formations and identification of the maximum anticipated ground water level as determined by the

minimum of one test hole, dug in close proximity, two feet below the bottom of the subsurface irrigation field or drip irrigation area together with a statement of types of soil based on soil classification at the proposed site. Soil and groundwater evaluations will be conducted by professionals fulfilling the requirements of R317-11;

(iii). details of construction necessary to ensure compliance with the requirements of this rule together with full description of the complete installation including installation methods, construction and materials, as required by the local health department; and

(iv). other pertinent information the local health department may deem appropriate.

(c). The installed graywater system shall be operated only after receiving a written approval or an authorization from the local health department after the local health department has made the final construction inspection.

(d). The local health department will require written operation and maintenance procedures including checklists and maintenance instructions from the designer.

(e). No graywater system, or part thereof, shall be located on any lot other than the lot which is the site of the building or structure which discharges the graywater unless, when approved by the local health department, a perpetual utility easement and right-of-way is established on an adjacent or nearby lot.

(f). Onsite wastewater systems existing or to be constructed on a given lot shall comply with the requirements of R317-4 or more restrictive local requirements. The capacity of the onsite wastewater system, including required future areas, shall not be decreased by the existence or proposed installation of a graywater system servicing a given lot.

(g). No potable water connection will be made to the graywater system without an air gap or a reduced pressure principle backflow prevention assembly for cross connection control, in accordance with R309-105.

(h). When abandoning a graywater system,

(i). the owner of the real property on

which such system is located shall render it safe by having the surge tank pumped out only in a manner approved by the health department;

(ii). the surge tank shall be filled completely with earth, sand or gravel within 30 days;

(iii). the surge tank may also be removed within 30 days, at the owner's discretion;

(iv) the approving local health department shall be notified at least 30 days before the planned abandonment.

R317-401-5. Design of Graywater Systems

(a). The basis of design for a graywater system shall be as follows:

Table 1. Basis of Design

Number of Bedrooms	Flow gallons per day
Minimum two bedrooms	120
Three bedrooms	160
Each additional bedroom	40

(b). No graywater system or part thereof shall be located at any point having less than the minimum distances indicated as follows:

Table 2. Separation Distances

Minimum Horizontal Distance (in feet) From	Surge Tank	Subsurface or Drip Irrigation Field
Buildings or Structures (1)	5 feet (2)	2 feet
Property line adjoining private property	5 feet	5 feet
Public Drinking Water Sources (3)	(4)	(4)
Non-public Drinking Water Sources		
Protected (grouted) source	50 feet	100 feet
Unprotected (ungrouted) source	50 feet (5)	200 feet (5)
Streams, ditches and lakes (3)	25 feet	100 feet (6)
Seepage pits	5 feet	10 feet
Absorption System and replacement area	5 feet	10 feet
Septic tank	none	5 feet
Culinary water supply line	10 feet	10 feet (7)

Footnotes:

(1). Including porches and steps, whether covered or uncovered, but does not include carports, covered walks, driveways and similar structures.

(2). For above ground tanks the local health department may allow less than five feet separation.

(3). As defined in R309

(4). Recommended separation distances will comply with the Source Water Protection requirements R309-600 and 605.

(5). Recommended separation distance may increase at the discretion of the local health department for adequate public health protection.

(6). Lining or enclosing watercourse or location above irrigation area may justify reduced separation at the discretion of the local health department.

(7). For parallel construction or for crossing requires an approval of the local health department.

(c). Surge Tank

(i). Plans for surge tanks shall include dimensions, structural, bracing and connection details, and a certification of structural suitability for the intended installation from the manufacturer.

(ii). Surge tanks shall be:

(A). at least 250 gallons in volumetric capacity to provide settling of solids, accumulation of sludge and scum unless justified with a mass balance of inflow and outflow and type of distribution for irrigation;

(B). vented to the surface with a locking, gasketed access opening, or approved equivalent, to allow for inspection and cleaning;

(C). constructed of structurally durable materials to withstand all expected physical forces, and not subject to excessive corrosion or decay;

(D). watertight;

(E). anchored against overturning;

(F). installed below ground on dry, level, well compacted soil; in a dry well on compacted soil; or above ground on a level, four-inch thick concrete slab;

(G). Permanently marked showing the rated capacity, and "GRAYWATER IRRIGATION SYSTEM, DANGER - UNSAFE WATER" on the unit;

(H). provided with an overflow pipe:

(I). of diameter at least equal to that of the inlet pipe diameter;

(II). connected permanently to sanitary sewer or to septic tank; and

(III). equipped with a check valve, not a shut-off valve - to prevent backflow from sewer or septic tank.

(I). provided with a drain pipe of diameter at least equal to that of the inlet pipe diameter;

(J). provided with a vent pipe in conformance with the requirements of the International Plumbing Code; and

(K). provided with unions and fittings for all piping in conformance with the requirements of the International Plumbing Code.

(d). Valves and Piping

(i). Graywater piping discharging into a surge tank or having a direct connection to a sanitary drain or sewer piping shall be downstream of an approved water seal type trap(s). If no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from any possible waste or sewer gases.

(ii). Vents and venting shall meet the requirements of the International Plumbing Code.

(iii). All graywater piping shall be marked or shall have a continuous tape marked with the words: DANGER - UNSAFE WATER.

(iv). All valves, including the three-way valve, shall be readily accessible.

(v). The design shall include necessary types of valves for isolation storage tank, irrigation zones and connection to a sanitary sewer or an onsite wastewater system.

R317-401-6. Irrigation Fields

(a). Each irrigation zone shall have a minimum effective irrigation area for the type of soil and absorption characteristics.

(b). The area of the irrigation field shall be equal to the aggregate length of the perforated pipe sections within the irrigation zone times the width of the proposed trench. The required square footage shall be determined as follows:

Table 3. Subsurface Irrigation Field Design

Soil Characteristics	Subsurface Irrigation Field area Loading, gallons of graywater per day per square foot
Coarse Sand or gravel	5
Fine Sand	4
Sandy Loam	2.5
Sandy Clay	1.6
Clay with considerable sand or gravel	1.1
Clay with sand or gravel	0.8

Table 4. Drip Irrigation System Design

Soil Characteristics	Drip Irrigation System Maximum emitter discharge, gallons per day	Minimum number of emitters per gallon per day of graywater
Coarse Sand or gravel	1.8	0.6
Fine Sand	1.4	0.7
Sandy Loam	1.2	0.9
Sandy Clay	0.9	1.1
Clay with considerable sand or gravel	0.6	1.6
Clay with sand or gravel	0.5	2.0

(c). No irrigation point shall be within two vertical feet of the maximum groundwater table. The applicant shall supply evidence of ground water depth to the satisfaction of the local health department.

(d). Subsurface drip irrigation system

(i). Minimum 140 mesh (115 micron)

filter with a capacity of 25 gallons per minute, or equivalent filtration, sized appropriately to maintain the filtration rate, shall be used.

(ii). The filter backwash and flush discharge shall be captured, contained and disposed of to the sewer system, septic tank, or, with approval of the local health department, in

a dry well sized to accept all the backwash and flush discharge water. Filter backwash water and flush water shall not be used for any purpose. Sanitary procedures shall be followed when handling filter backwash and flush discharge of graywater.

(iii). Emitters recommended by the manufacture shall be resistant to root intrusion, and suitable for subsurface and graywater use.

(iv). Each irrigation zone shall be designed to include no less than the number of emitters specified in this rule.

(v). Minimum spacing between emitters should be 14 inches in any direction, or as recommended by the manufacturer.

(vi). The system design shall provide user controls, such as valves, switches, timers, and other controllers as appropriate, to rotate the distribution of graywater between irrigation zones.

(vii). All drip irrigation supply lines shall be:

(A). polyethylene tubing or PVC class 200 pipe or better and schedule 40 fittings;

(B). With solvent-cemented joints, inspected and pressure tested at 40 pounds per square inch and shown to be drip tight for five minutes, before burial; and

(C). buried at a minimum depth of six inches. Drip feeder lines can be polyethylene or flexible PVC tubing and shall be covered to a minimum depth of six inches.

(viii). Where pressure at the discharge side of the pump exceeds 20 pounds per square inch, a pressure-reducing valve able to maintain downstream pressure no greater than 20 pounds per square inch shall be installed downstream from the pump and before any emission device.

(ix). Each irrigation zone shall include a flush valve/anti-siphon valve to prevent back siphonage of water and soil.

(e). Subsurface Irrigation Field

(i). Perforated sections shall be a minimum three-inch diameter and shall be constructed of perforated high-density polyethylene pipe, perforated ABS pipe, perforated PVC pipe, or other approved materials, provided that sufficient openings are available for distribution of the graywater in the

trench area. Material, construction and perforation of the piping shall be in compliance with the requirements of the International Plumbing Code.

(ii). Clean stone, gravel, or similar filter material acceptable to the local health department, and varying in size from 3/4 inch to 2 1/2 inches, shall be placed in the trench to the depth and grade required by this section. Perforated sections shall be laid on the filter material. The perforated sections shall then be covered with filter material to the minimum depth required by this section. The filter material shall then be covered with landscape filter fabric or similar porous material to prevent closure of voids with earth backfill.

(iii). No earth backfill shall be placed over the filter material cover until after inspection and approval of the local health department.

(iv). Subsurface Irrigation fields shall be constructed as follows:

Table 5. Subsurface Irrigation Field Construction Details

Description	Minimum	Maximum
Number of drain lines		
per subsurface irrigation zone	one	---
Length of each perforated line, feet	---	100
Bottom width of trench, inches	6	18
Total depth of trench, inches	12	---
Spacing of lines, center to center, feet	4	---
Depth of earth cover		
on top of gravel, inches	4	---
Depth of filter material		
cover over lines, inches	2	---
Depth of filter material		
beneath lines, inches	3	---
Grade of perforated lines,		
Inches per 100 feet	Level	4

(f). Construction, Inspection and Testing

(i). Installation shall conform to the equipment and installation methods described in the approved plans.

(ii). The manufacturer of all system components shall be properly identified.

(iii). Surge tanks shall be filled with water to the overflow line prior to and during construction inspection. All seams and joints shall be left exposed and the tank shall remain watertight.

(iv). The irrigation field shall be installed in the area which has soils similar to the soils which have been evaluated, and has absorption rate corresponding to the given soil classification.

(v). A graywater stub-out may be allowed for future construction, provided it is capped prior to the connection to the installed irrigation lines and landscaping. Stub-out shall be permanently marked: GRAYWATER STUB-OUT, DANGER UNSAFE WATER.

(vi). A flow test shall be performed throughout the system, from surge tank to the point of graywater irrigation. All lines and components shall be watertight.

KEY: wastewater, graywater, drip irrigation
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